REMARKS

1. Claims 1-3, 5-7, 10-14, and 16 were rejected under 35 U.S.C. § 102(b) as anticipated by Finn et al. (U.S. 6,431,284). Independent claim 1 is therefore amended to more particularly claim the subject matter that the applicant considers as the invention. Specifically, "a floating body" is amended read "a floating tension leg platform." A tension leg platform is a well known in the art as a type of floating platform that is used for drilling and production in relatively deep water that is moored by generally vertical tendons, which are typically high tensile strength steel tubes attached at each of the corners of the platform and connected to tendon foundation templates on the seabed. The tendons pull the buoyant hull down to minimize lateral movement of the platform.

Finn et al., on the other hand, discloses a spar type floating platform. A spar platform is also a well known in the art as a type of floating platform that is used for drilling and production in relatively deep water, which consists of a single, large diameter vertical cylinder with a catenary mooring by a series of cables or lines. The large cylinder serves to stabilize the platform in the water yet allows for movement to absorb forces due to storms. Finn does not disclose a TLP, as required by amended claim 1, that longitudinally suspends risers or umbilicals at an elevation above the hull and laterally supports the risers or umbilicals at an elevation at the hull.

Furthermore, independent claim 1 is amended to require that the risers or umbilicals border the hull. The specification supports this limitation:

> "It is advantageous to place the riser close to the vessel hull to provide increased and simplified lateral support to the risers or umbilicals without an extensive network of struts. Further, placing the risers close to the hull results in reduced riser loads and reduced riser stroke for a given horizontal platform displacement, which allows more relaxed riser tensioner design requirements with a concomitant cost savings. . . . The primary object of the invention is provide a floating platform designed to have risers or

> umbilicals that are vertically or near vertically suspended above the keel of the floating platform and that are laterally supported by keel guides positioned along the perimeter of the platform's hull at an elevation at or near the keel. . . . The risers are suspended vertically from above the keel (and usually, but not necessarily, above the water's surface) and are supported laterally at or near the hull by keel guides positioned along the submerged perimeter of the platform's hull, or within the hull by production riser slots." Specification at 4 ll. 3-7, 10-13, p. 5 ll. 8-11.

Finn et al. does not disclose a system where all production risers border the hull. Conversely, Finn discloses a grid-like array of risers 16, 18 that are vertically supported by a riser support table 28 (Figs 2-5). The risers pass through the large diameter vertical spar cylinder while maintaining their grid spacing. See Finn Figures 1-2. Such a grid-like arrangement is illustrated in the prior art Figures 3-4 of applicant's specification as an example of a riser arrangement where the risers do not border the vessel hull. Therefore, it is believed that independent claim 1 and claims 2-3, 5-7, 10-14 and 16 dependent thereon are novel and patentably distinct over Finn.

2. Claims 1-7, 9-14 and 16 were rejected under 35 U.S.C. § 102(b) as anticipated by White, et al. (U.S. 5,147,148). White describes a heave-restrained platform that, both according to White and as generally understood to routineers in the art, is clearly not a tension leg platform, as required by independent claim 1 as amended herein. See White col. 3 l. 13 – col. 4 l. 17.

In the embodiments of Figures 5-15, White teaches vertically supporting the upper ends of risers at an elevation at the hull and below the waterline (see, e.g., porches 106 (Fig. 5), 206 (Fig 7), and 314 (Fig 9)). Extensions (e.g., 113 (Fig 5), 213 (Fig. 7) and 315 (Fig. 9)) connect to the upper ends of the risers (e.g., 109 (Fig 5), 209 (Fig. 7)) to provide fluid access to the risers at deck level. *See e.g.,* White col. 8 ll. 48-51, col. 10 ll. 25-27. These embodiments are essentially the same as the prior art described in applicant's specification with regard to Figures 1-4. As

independent claim 1 includes the step of suspending the risers from an elevation above the hull, the embodiments of White Figures 5-15 do not anticipate claim 1.

White does disclose one embodiment where the risers are suspended from deck level at riser terminations 9. White Figures 1-4. However, claim 1, as amended herein, requires the upper end of a vertically oriented mooring tendon to be connected to a tendon porch at the TLP hull in order to moor the TLP. White does not include such a mooring tendon. Rather, the production risers act as mooring tendons ("The risers are under sufficient tension to function as tendons to pull the floating structure 1 down with the water to a sufficient depth that heave is completely restrained as with a TLP." White col. 8 ll. 51-54). As the upper ends of the production risers of the White embodiment of Figures 1-4 are suspended from deck level and are not connected to tendon porches at the hull, they do not satisfy the claim limitation of the upper end of a mooring tendon connected to a tendon porch at the TLP hull. Nor do the lateral mooring lines 16 satisfy this claim limitation, because they are not predominantly vertically oriented. White Fig. 1. Therefore, independent claim 1 as amended herein is novel over White.

Additionally, independent claim 1 is patentably distinct over White. The White platform of Figures 1-4, which has production risers perform the function of mooring tendons, may reduce the problems of riser stroke and tensioner size identified the applicant's specification, but because in the White platform of Figures 1-4 the entire buoyancy load passes through the deck and superstructure, deck structural support requirements are dramatically increased over an equivalent platform moored at tendon porches near the keel. Thus, there would have been no motivation to combine.

In view of the above arguments, White neither anticipates nor renders obvious independent claim 1 as amended herein. This, independent claim 1 and claims 2-7, 9-14 and 16 dependent thereon are thus novel and patentably distinct over White.

3. Claims 23, 25, 26, 31, 32, 34-36, 39, 41, 42 and 45-47 were rejected under 35 U.S.C. § 102(b) as anticipated by Thomas (U.S. 6,406,223). In response, independent claims 23 and 36 are amended to more particularly claim the subject matter that the applicant considers as the invention. Specifically, "a floating body" is amended read "a floating tension leg platform." A tension leg platform is a well known in the art as a type of floating platform that is used for drilling and production in relatively deep water, which is moored by generally vertical tendons which are typically high tensile strength steel tubes attached at each of the corners of the platform and connected to tendon foundation templates on the seabed. The tendons pull the buoyant hull down to minimize lateral movement of the platform.

Thomas, on the other hand, discloses "a jack-up oil platform of the semi-submersible type." Thomas col. 3 ll. 12-13. Thomas does not disclose a tension leg platform moored by predominantly vertical tendons (see the lateral mooring tethers 26 of Thomas Fig. 1) so as to prevent vertical platform heave but allow limited horizontal surge and sway. Rather, Thomas teaches a "jack-up oil platform of the semi-submersible type" for simplifying the ram tensioners that are used to compensate for the inevitable vertical platform displacement due to tides and heave. Thomas col. 1 ll. 36-59. Thus, as amended herein, independent claims 23 and 36, and claims 25, 26, 31, 32, 34, 35, 39, 41, 42 and 45-47 dependent thereon, are novel and patentably distinct.

4. Claims 24 and 37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Thomas in view of Eie (U.S. 4,938,632).

Eie discloses a tension leg platform, which is well known in the art as a platform arrangement in which the long flexible mooring tendons allow significant side-to-side movement (surge and sway) of the platform but essentially prevent any vertical movement (heave) of the platform. "The pulling down of the buoyant body is accomplished to reduce vertical movements of the buoyant body when the same is subjected to environmental loads, such as waves. Thereby is established a substantially constant distance between the deck and the sea bed." Eie col. 1 ll. 26-31.

Thomas, on the other hand, discloses "a jack-up oil platform of the semi-submersible type." Thomas col. 3. ll. 12-13. Thomas does not disclose a vessel that is substantially heave restrained, such as the TLP of Eie. Rather, Thomas teaches a process for simplifying ram tensioners that tension production risers to compensate for inevitable vertical displacement of a non-heave-restricted platform due to tides and heave. Thomas, Col. 1 ll. 36-59. "Because the [semi-submersible] platform remains afloat, it is subjected, on the one hand, to variations in water level due to the tide, and, on the other hand, to movements associated with heave. In consequence, the means of tensioning the risers must make it possible to compensate for the vertical oscillation of the platform over time. The maximum vertical oscillation is commonly 4 to 12m. . . . In current installations, the means of tensioning the risers comprise hydropneumatically operated rams arranged between the top end of the riser and the platform. . . . [T]he rams currently in use are very bulky and employ complex technology. . . . The object of the invention is to provide a production installation [of the aforementioned type] in which the tensioning of each riser does not require the use of complex and bulky means on the hull of the platform." Thomas col. 1 ll. 36-62.

It would not have been obvious for a routineer to combine the teachings of Eie and Thomas to arrive at the claimed invention, as amended herein, because mooring the Thomas platform with predominantly vertically oriented tendons so that the Thomas platform is heave restrained destroys the object of Thomas invention. "The object of the invention is to provide a production installation in which the tensioning of each riser does not require the use of complex and bulky means on the hull of the platform. To this end, the subject of the invention is an installation for producing oil . . . of the aforementioned type, characterized [by simplified] tensioning means. . . ." Thomas col. 1 ll. 56-62. A § 103 rejection based upon a combination of references that destroys the intent, purpose, or function of the invention disclosed in the reference is not proper and a *prima facie* case of obviousness cannot be properly made, because there would be no technological motivation for engaging in the modification or change. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Thus, claims 24 and 37, as amended, are patentably distinct over Thomas in view of Eie.

For the same reasons set forth above with regard to claims 24 and 37, claims 23, 25, 26, 31, 32, 34-36, 39, 41, 42 and 45-47 are also patentably distinct over Thomas in view of Eie.

5. Claims 23-26, 30, 31, 32, 34, 35, and 45-47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Peterson (U.S. 4,657,439) in view of Eie, in that Peterson discloses a series of risers coupled about the interior moonpool perimeter of the hull, with the risers being laterally inserted into keel guides and tensioned by winches to allow vertical movement, and Eie shows a mooring.

Peterson discloses a method for coupling a riser or umbilical to a moored floating body having a hull with a keel, the method including the steps of operatively coupling a lower end of a tubular member to a subsea well, longitudinally suspending an upper end of the tubular member

from a first elevation above the hull, and laterally supporting the tubular member at a second elevation at the hull. However, in Peterson, the lateral support is provided by a buoyant member 27 which slides up and down in a vertical cylinder 31 as the waterline shifts. The applicant's invention includes a lateral support that is fixed to the hull, and claim 23 includes a limitation of a bearing assembly having a vertically oriented generally cylindrical passage for receiving a tubular member, the bearing assembly being *fixed to the hull*. Peterson's bearing assembly is buoyant member 27, which clearly is not fixed to the hull because it freely slides within buoyant member opening 31.

Peterson does not suggest the use of a fixed support, nor provide motivation therefor. "A method and apparatus therefore need to be developed that allows a riser to be passively tensioned by a buoyant member, without the inherent disadvantages mentioned previously in the use of such a member." Peterson col. 2 ll. 24-27. As Peterson requires a buoyant member, and suggests using only the buoyant member for support of the riser, Peterson does not provide motivation for a lateral riser support fixed to the hull.

Eie discloses a tension leg platform, which is well known in the art as a platform arrangement in which the long flexible mooring tendons allow significant side-to-side movement of the platform but essentially prevent any vertical movement of the platform. Eie col. 1 ll. 26-31. However, Eie does not disclose a lateral riser support that is fixed to the hull.

Paterson in combination with Eie fail to disclose every limitation of claim 23, namely a lateral riser support that is fixed to the hull. Where the references taken together fail to disclose all of the explicit limitations in a claim, a prima facie case of obviousness is not shown. *In re Grasselli*, 713 F.2d 731, 743, 281 USPQ 769, 779 (Fed. Cir. 1983). Therefore, claim 23, and

claims 24-26, 30, 31, 32, 34, 35, and 45-47 depending thereon, are patentably distinct over with Peterson in view of Eie.

In summary, claims 1-7, 9-14, 16, 23-26, 30-32, 34-37, 39, 41, 42, and 45-47 are pending in the application. As presented herein, these claims are believed to be new and unobvious over the cited prior art. Applicant believes the application is in condition for allowance. Allowance of the claims and passage to issue is requested.

Respectfully submitted,

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Date: March 28, 2007